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ABSTRACT

This is the second in a series of booklets on reasonable accommodation. It focuses on a job analysis process that can be used to plan and select appropriate actions necessary to accommodate handicapped persons in specific jobs and work environments. The guide is aimed especially at federal agencies, which are required to make reasonable accommodation to the known physical or mental limitations of a qualified handicapped applicant or employee unless the accommodation would impose an undue hardship on the agency. Presented in a question and answer format, the guide contains seven sections that cover the following topics: job analysis and reasonable accommodation, functional job requirements, importance of information about the work environment, identification of functional job requirements and work environment factors, kinds of limitations that persons with disabilities have, and the process used for planning accommodations. A sample job analysis form and three case studies are provided to amplify the subject matter. A glossary of functional limitations categories completes the booklet. (KC)

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Management Series

# Handbook of Job Analysis for Reasonable Accommodation

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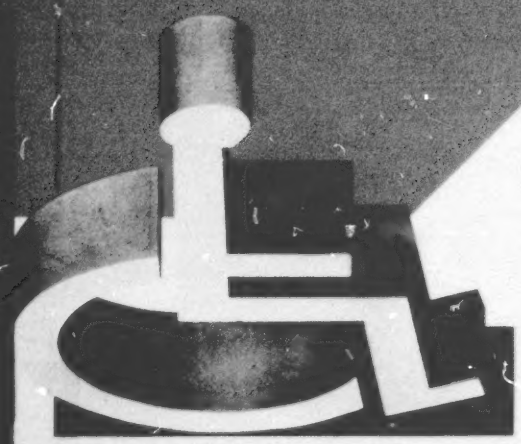

# Preface

This is the second in a series of booklets on reasonable accommodation. The first, "Handbook on Reasonable Accommodation" (Personnel Management Series 720-A, March 1980), defines a wide range of actions that can be taken to accommodate handicapped individuals. This booklet focuses on a job analysis process which can be used to plan and select appropriate action(s) necessary to accommodate handicapped individuals in specific jobs and work environments.

As specified in the Code of Federal Regulations [(29 CFR 1613)(29 CFR 1613.704 on reasonable accommodations)], Federal agencies are required to make reasonable accommodation to the known physical or mental limitations of a qualified handicapped applicant or employee unless the accommodation would impose an undue hardship on the agency.

This publication was prepared in the Selective Placement Programs Division of the Office of Affirmative Employment Programs, under the direction of A. Diane Graham and the supervision of Hedwig Oswald. The major work was done by Sheldon Yuspeh. The manuscript was prepared for printing by Colleen B. Daniel and Lincairn Preston.

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## What Does Job Analysis Have to do With Reasonable Accommodation?

A reasonable accommodation is an adjustment made to a job and/or the work environment that enables a qualified handicapped person to perform the duties of that position. The types of accommodations which can be made are numerous and may include: worksite modifications; adjusting work schedules; restructuring jobs; acquisition or modification of equipment or devices; providing interpreters, readers, or personal assistants; and reassigning or retraining employees.

When planning accommodations it is important to remember that accommodations are highly individualized and what may have been successful for one disabled person may not be appropriate or necessary for another. This holds true for individuals with the same or similar disabilities. In each case the need for an accommodation and the functional problem(s) precipitating this need must be clearly identified and understood before appropriate planning of accommodations can take place. This involves analysis of the known abilities and limitations of a disabled individual with respect to the functional requirements of a particular job and the nature of the work environment in which the job is performed. A job analysis is crucial and makes this possible.

"Job Analysis," simply defined, is the process by which information relative to a specific job, position, or occupation is collected, analyzed, and interpreted. With respect to reasonable accommodation, it is the essential process through which accurate and complete information about the functional job requirements of a particular job and the nature of the work environment can be identified. A comparison of information collected through a job analysis process to information on the functional abilities and limitations of a disabled individual provide the basis from which potential problems can be identified, understood, and appropriate accommodations planned.

## What are Functional Job Requirements?

Every employee performs a finite number of work tasks which, when added together, constitute the total work assignment of an individual's job. To perform satisfactorily, a worker must engage in activities, physical and/or mental, which will result in the completion of assigned tasks. The physical and mental capacities normally required to complete work activities are the functional job requirements. These job requirements provide detailed information about:

- **How tasks are accomplished.** (Methods, techniques, tools or equipment employed by a worker to complete work tasks).
- **Physical movements and/or mental processes involved in the work activity.** (Descriptions of physical involvement include: pulling, pushing, lifting, carrying, kneeling, sitting, reading, climbing,

walking, hearing, seeing. Examples of mental processes include: reasoning, remembering, reading, observing.)

- **Degrees of physical effort and/or the complexity of mental processes involved in the work activities.**
- **The duration or total time involved in performing each work activity.**
- **The frequency with which work activities are performed.**

Functional job requirements of a position provide essential baseline information which can be compared to the physical and/or mental capacities or limitations of an employee/applicant with a disability. This comparison will allow all potential functional incompatibilities to surface so that the need for accommodations can be explored.

## How Important is Information About the Work Environment?

The physical surroundings or environment in which work activities are performed also places demands on employee's physical and mental capacities. In fact, very often it is not work activities at all which present functional problems for an employee with a disability, but the environment itself. Some examples include:

- an employee in a wheelchair who experiences no functional difficulties in pulling reference material from a bookcase, but the placement of furniture in the worksite prevents access to the bookcase;
- a mentally retarded employee who is perfectly capable of understanding simple instructions from a supervisor, but excessive noise at the worksite distracts the employee from focusing on the supervisor's communications; and
- an employee who suffers from arthritis who, under ordinary climatic conditions, experiences no difficulty in performing writing tasks, but if assigned to work at a cold or damp duty station, the condition may become aggravated to a point where writing tasks become impossible.

Information about work environments provide accurate descriptions such as the following:

- **the location of work stations ordinarily used by an employee when performing tasks associated with the position** — indoors, first, second, third or more floors, outdoors, and where locations constantly vary;
- **mobility barriers which may exist in getting to or going between assigned work areas** — steps, narrow passageways, slick or thickly carpeted floors, steep grades, protrusions, narrow door ways;

- **physical design of assigned work areas** — room dimensions, placement and dimensions of furniture, equipment, tools, power switches, pathways, floor coverings, proximity to other workers, obstacles;
- **climatic conditions of assigned work areas** — temperature range, humidity, draftiness, dramatic changes in climate within, or between work areas;
- **atmospheric conditions of assigned work areas** — fumes, odors, dust, mist, gases, ventilation;
- **presence and level of noise and/or vibrations in the work area;** and
- **potential hazards in the work area** — moving mechanical parts, high voltage wiring, explosive materials, equipment which radiates high levels of heat.

## How are Functional Job Requirements and Work Environment Factors Identified?

Identification of functional job requirements and work environment factors are accomplished through a job analysis process. Many methods of job analysis are currently in use, but not all will provide relevant information to facilitate the process of identifying the need for reasonable accommodations.

A common way of categorizing job analysis is in terms of whether it is job oriented or worker oriented. Worker oriented job analysis methods usually focus on knowledge, skills, abilities and other characteristics which workers should possess to perform well in a position. Analysis methods of this type are ideally suited for such purposes as developing employee selection instruments, but are of little assistance in defining functional and environmental demands placed on the worker by the position. A job oriented or task analysis is a more appropriate method to use when planning reasonable accommodations.

Job task analysis is a process of identifying tasks of a position and ascertaining functional demands placed on employees by the tasks and the environment. A "work task" is a distinct identifiable work activity that constitutes one of the logical and necessary steps to perform a job. Good examples are: "codes data," "answers telephone," "prepares technical reports," and "directs visitors to appropriate office."

When identifying tasks, the analyst should seek a wide variety of input from persons with intimate knowledge of the position, such as supervisors and employees who currently perform the job or have performed them in the past. This will minimize the possibility of overlooking tasks which are performed with less frequency or those of lesser importance.

Job requirements are derived through careful observation of employees performing job tasks at the worksite. If possible, it is usually best to observe more than one worker as tasks can often be accomplished in more than one way. Knowledge of alternative techniques, methods, and tools for accomplishing tasks are of great assistance when determining the most productive and effective way in which a person with a disability can function.

The nature of the environment is also determined at the worksite. Determining the physical design of the environment involves knowledge about dimensions of furniture, equipment, work space, clearance, etc. At some point during the analysis other key locations, such as bathrooms, cafeteria, entrances, doorways, elevators, stairways, and hallways should be examined to determine accessibility. Also, direct observation and discussion with workers provide a detailed picture of other environmental factors, such as climatic and atmospheric conditions and potential health hazards.

## What Kinds of Functional Limitations do Persons with Disabilities Have?

Unfortunately, the physical and mental capacities of persons with disabling conditions are all too often categorically stereotyped by the disabling condition itself. The designation of a disabling condition should do little more than suggest a range of possible limitations which individuals may experience to some degree. For example, it is often assumed that individuals with cerebral palsy are mentally retarded, some are but most are not, and in fact many have IQ's in the genius range. To many observers, a person with quadriplegia is one whose hands, arms, and legs are totally paralyzed. Although quadriplegia denotes loss of physical function in all four extremities, the degree to which extemities are affected can vary appreciably from one individual to another. All disabilities, regardless of severity, can be described as one or some combination of limitations, as listed in Appendix A, Glossary of Functional Limitations Categories.

The ways in which a disabled individual functions are unique to that person, therefore, the capabilities must be ascertained on an individual basis. The disabled person should always be consulted as the primary source for understanding his or her abilities and limitations with respect to the functional requirements of the job. Also, supplementary information can be obtained thorugh consultation with specialists in the fields of vocational rehabilitation and medicine.

Requests for such information should always be prefaced by an explanation of the purpose for the request and of the process used for planning reasonable accommodations. It should be emphasized that this information will not be used as a selection factor. In fact, prior knowledge of potential problems and more importantly, knowledge that such problems are manageable and can be accommodated, will instead

serve to remove disability as an underlying concern in the selection process.

## What Process Is Used For Planning Accommodations?

The process of planning accommodations is really quite simple when broken down into a step-by-step procedure as follows:

- **Step One — Conduct the job analysis**
  Step one involves conducting the job analysis to gain a clear understanding of job requirements and the work environment. A well designed form for documenting collected data (see example which follows) can simplify this step and facilitate further analysis.

- **Step Two — Determine functional characteristics**
  Step two involves ascertaining the functional characteristics of the job applicant or employee. The emphasis here is not only to learn the type of handicap, but also to fully understand the nature of the handicap and the specific abilities and limitations of the individual.

- **Step Three — Identify problems requiring resolution**
  Step three requires identification and understanding of incompatibilities which exist between the known physical and/or mental limitations of the applicant or employee and the job requirements and/or work environment which impede or are likely to impede satisfactory performance by the individual. A careful comparison of job analysis data and the characteristics of the disabled employee or applicant is essential to this step.

- **Step Four — Identify and evaluate remedial alternatives**
  Step four involves the development of a list of potential remedies to determine the most reasonable methods to resolve identified problems. There are usually a number of possible solutions to a problem and the proper choice must be made on an individual basis. When brainstorming possible alternatives, involvement of all those who will be affected, especially the disabled individual, is recommended. When it is time to make a decision regarding the final selection of an accommodation, involvement of the disabled individual is essential. Accommodations prescribed without involvement of the disabled individual are rarely as effective or appropriate as those which are planned with such input.

To illustrate this process, consider a hypothetical case of three persons with different disabilities all selected for computer programmer trainee positions. The selecting official wants to insure that each person will be properly accommodated in the job. For the purpose of this example we will assume that the job requirements and environment of all positions to be the same. While consulting with the agency selective

placement coordinator the selecting official learns about the appropriate process and important considerations involved in planning reasonable accommodations. The coordinator prepares a form for documenting functional job requirements and environmental factors and a job analysis of the position is conducted (step one). The data collected by the analyst is presented on the following sample job analysis form.

# Sample Job Analysis Form

## Position Title: Computer Programmer (Trainee)

General Job Description: The incumbent participates as a member of a section responsible for new development and maintenance of data processing systems in support of the agency's mission. These systems are business oriented and usually programmed in Cobol language. Programming assignments are selected for the incumbent of this position by a team leader with the aim of assisting the incumbent to develop higher levels of programming skills. Typical assignments involve developing computer instructions to provide supportive information that does not require substantive knowledge of the subject matter being automated. Supportive information includes such item as as: name/address lists; account number listings; and simple summary tabulations.

## I. Functional Requirements

| Task | Method/Technique | Tools/ Equipment | Frequency/ Time Required | Physical Involvement | Mental Involvement |
|---|---|---|---|---|---|
| 1. Receive programming assignment | Assignments are provided through written program specification sheets with verbal communications from supervisor. Verbal communication is accomplished both face-to-face and over the telephone. | Telephone (dial type) | Ongoing/will vary according to nature of assignments. | —Holding, seeing, reading: spec sheets<br>—Hearing: communication<br>—Speaking: communication<br>—Lifting: phone receiver<br>—Dialing: telephone communication | —Interpreting/understanding simple written or verbal instructions. |
| 2. Develop program logic | Programmer organizes a logical sequence of processing instructions on paper in block diagram flow chart format. Reference material stored in bookcase and on desk top file are sometimes used to facilitate task completion. | —Reference material (programming, texts, computer systems, manuals, published standards and procedures)<br>—template<br>—pen/pencil<br>—paper | Same as task #1 | —Seeing, eye-hand coordination, writing: preparation of diagram/chart<br>—Reaching (max. 3'), lifting (up to 5 lbs), turning pages: reference materials | —Logical problem solving of limited scope<br>—Ability to understand technical materials |

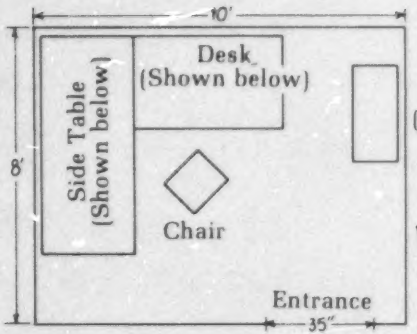
## I. Functional Requirements (Continued)

| Task | Method/Technique | Tools/ Equipment | Frequency/ Time Required | Physical Involvement | Mental Involvement |
|---|---|---|---|---|---|
| 3. Code, enter, and compile program logic | Program statements from diagram/chart are converted to appropriate language statements on paper, keyed to computer, and compiled using CRT terminal. Reference material is sometimes used to augment programmers knowledge of desired computer language. | —Reference material<br>—Pen/pencil<br>—Paper<br>—CRT terminal | Same as task #1 | —Seeing, reading: CRT diagrams/ charts, reference materials<br>—Writing: language statements<br>—Reaching: reference material; CRT keyboard (max. 3')<br>—Lifting: reference material (max. 5 lbs)<br>—Turning pages: reference material<br>—Keying: CRT keyboard | —Knowledge of required computer language<br>—Ability to understand technical material |
| 4. Test coding for correctness | Programmer runs the program and requests sample output from computer using CRT terminal. Output is reviewed on CRT screen for correctness. If not correct programmer reviews coding for errors, makes corrections, and repeats test procedure. | —CRT terminal,<br>—Specification sheet<br>—Reference material | Same as task #1 | —Seeing, reading: CRT screen, reference material<br>—Keying: CRT keyboard<br>—Reaching: keyboard, reference material (max. 3') | —Logical problem solving of a limited scope<br>—Ability to understand technical material<br>—Knowledge of required computer language |
| 5. Prepare program documentation | Programmer documents logic and coding system used to complete programming assignment generally in prescribed format. | —CRT terminal, or<br>—Pen/pencil or<br>—Typewriter (electric) | Same as task #1 | —Eye-hand coordination: place form in typewriter<br>—Typing: typewriter<br>—Keying: CRT terminal<br>—Reach: place form in typewriter and use of keyboards (max 2') | —Understanding and knowledge of documentation procedure |

## II. Work Environment Factors

| Location | Mobility Barriers to Access Worksite | Climatic/Atmospheric Conditions at Worksite | Type and Level of Noise/Vibration | Potential Health Hazards |
|---|---|---|---|---|
| —Office building<br>—Sixth floor<br>—Room 600 | —Doors to enter building require considerable effort to open<br>—Elevator call and floor buttons are difficult to reach from wheelchair 62" up from floor and buttons do not contain raised or brailled symbols<br>—Long hallway to negotiate from elevator to worksite - approx. 70 yds. | —Comfortable - low humidity, temperature ranges between 68° F. and 76°F., minimal drafts. Ventilation good. | —Noise: minimal<br>—Vibration: none | —Extended viewing of CRT screen may produce eye strain, and/or headaches |

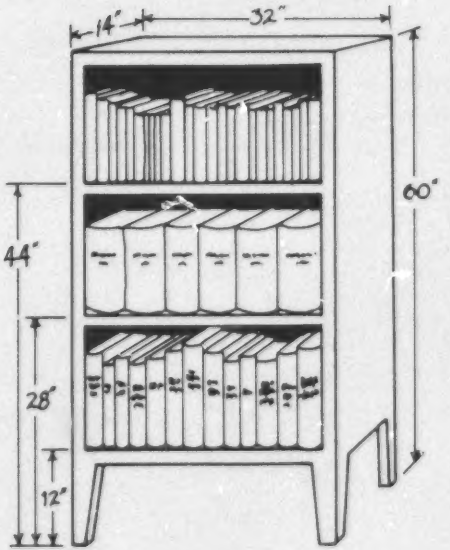
# Work Station

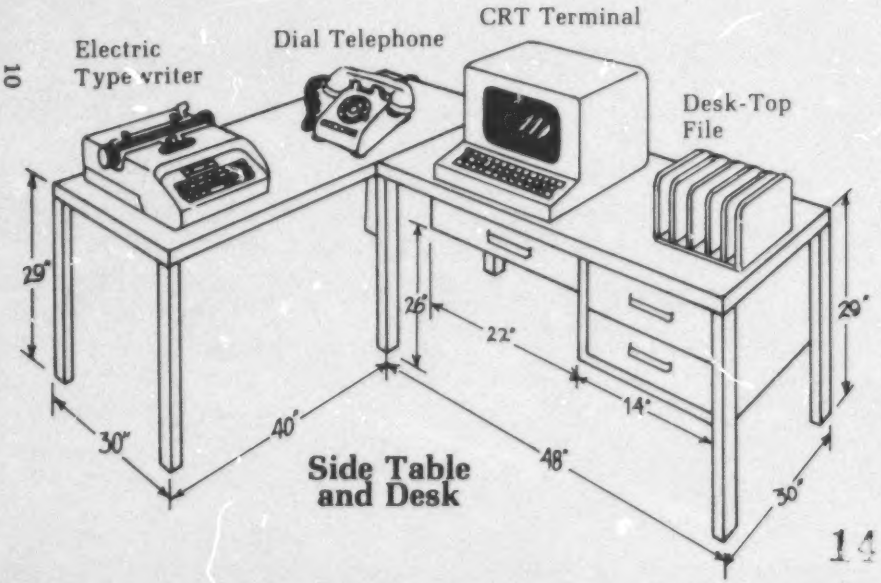



Bookcase
(Shown at right)

**Work Station**

**Bookcase**




**Side Table and Desk**

Having completed the job analysis, each of the three selected persons is contacted and asked to provide information concerning their functional abilities and limitations. With the cooperation of each of the three selected persons the following information is obtained (step two).

**Person #1** is legally blind due to optic atrophy. The person's vision in the right eye, the most functional eye, is 3/800 (person can see at three feet what someone with "normal" vision is able to see at 800 feet). The person only has gross object perception, which is the ability to perceive large objects in the left eye. The person does have color perception as well as sufficient vision for personal mobility while walking, however, due to a lack of peripheral vision, this individual may have difficulty detecting wall protrusions and other unfamiliar obstacles which are not directly in the individual line of vision. The individual can read Braille as well as printed or typed material which is magnified 10 times the size of normal type, but finds handwritten material difficult to read regardless of magnification. Aside from these visual limitations the individual experiences no other physical limitations.

**Person #2** is totally deaf due to complications experienced as a result of a childhood disease at age 12. The person is able to speak, but, speech is difficult to understand as the individual cannot easily control tone and volume. The person is proficient in sign language and can express thoughts well in writing. All other functional abilities are normal.

**Person #3** is quadriplegic due to spinal cord injury. The person has good gross motor functioning and range of motion in upper extremities, poor grasp, fair finger dexterity, and suffers from occasional arthritis flareups in both knees. Lifting objects from low shelves (below 20") or pulling objects from high shelves (above 60") is difficult for the person. Due to poor grasp, the person also experiences problems in holding pens or pencils firmly for writing, however, the individual is able to use a typewriter effectively. The person uses a manual wheelchair for mobility and due to the dimensions of the chair is unable to get close to a work surface with less than a 28 inch clearance (floor to underside of work surface) or through a hallway or door with less than 32" clearance. The person's speech, hearing, and vision are normal.

By comparing the functional characteristics of each selected person against the job analysis data the selecting official with the assistance of the selective placement coordinator is now able to identify and understand potential problems which might impede the performance of job duties by each individual (step three). Each selected person is again contacted to discuss the potential difficulties and assist the selecting official, supervisor and coordinator in exploring the possible solutions to resolve the difficulties (step four). The charts which follow summarize the results of this process for each person.

## Person #1

| Functional Problems | Cause of Problem | Potential Remedial Approaches |
|---|---|---|
| 1. Seeing/reading written specification sheets, reference material, self-generated written or typed material, (i.e., diagrams, charts, program documentation reports), letters/numbers on phone dial, CRT screen output. | — person cannot see/read standard letter-sized printed or typed material<br>— person cannot see/read handwritten material regardless of letter size. | — provide reader<br>— provide only printed or typed materials with special equipment to magnify copy 10 times normal letter size.<br>— enlarge letter/numbers on phone.<br>— provide only Brailled material<br>— replace terminal and/or adapt with voice output or variable screen magnification capability. |
| 2. Preparing hard copy charts, diagrams, and reports. | — same as above. | — provide reader<br>— provide Braille typewriter<br>— provide tape recorder with indexing feature<br>— provide equipment to magnify typed copy 10 times normal size<br>— provide hard copy output component for adapted CRT terminal. |
| 3. Accessing reference material from bookcase and/or table to file. | — person cannot see/read spines of manuals/texts which is required to pull desired material from bookcase/desk file<br>— person cannot see elevator call buttons or tell which floor he/she is on. | — color code reference material<br>— provide reader<br>— Braille spines of manuals/texts<br>— place all reference material in memory computer for access on adapted CRT terminal<br>— affix raised and/or Brailled symbols along side of elevator buttons<br>— provide auditory signal system to indicate floor on elevator |

## Person #2

| Functional Problems | Cause of Problem | Potential Remedial Approaches |
|---|---|---|
| 1. Hearing verbal communications from supervisor face-to-face or over a telephone | — person is totally deaf | — provide only written communications<br>— provide interpreter<br>— provide teletypewriter (TTY) devices to both individual and supervisor to allow telephone communications.<br>— provide sign language training to supervisors and coworkers.<br>— Arrange room furniture to facilitate face to face communications |
| 2. Receiving incoming telephone calls | — person cannot hear telephone ring | — adapt phone with visual system such as flashing light instead of bell to alert individual of incoming (TTY) calls<br>— assign secretary to take incoming calls and make outgoing calls. |
| 3. Awareness of emergency situations in the work environment | — person cannot hear warning signals such as fire alarms or verbal warnings. | — install visual alarm systems such as flashing lights<br>— Develop office/building procedures to insure that the individual is made aware of emergency situations. |

## Person #3

| Functional Problems | Cause of Problem | Potential Remedial Approaches |
|---|---|---|
| 1. Preparing hard copy charts and diagrams using paper, pen or pencil and template | — person grasp is not sufficient to hold pen or pencil firmly for writing | — provide hard copy output component to CRT terminal and program computer to generate block diagram and flow chart symbols<br>— provide hand orthosis to allow writing with pen or pencil<br>— provide assistant to draw symbols after logic statements have been typed |
| 2. Accessing work surface | — floor to underside of work surface on right side does not allow sufficient wheelchair clearance due to center drawer | — modify desk by removing center drawer |
| 3. Accessing reference material from bookshelves | — lower shelf in bookcase is too low for applicant to easily lift manuals/texts for reference | — place all manuals/texts on upper two shelves only<br>— provide personal assistance<br>— provide additional bookcase with shelves at appropriate height (if additional space is available) |
| 4. Entering the building | — heavy doors are difficult to open due to poor grasp and lack of leverage from wheelchair | — provide automatic door opener<br>— adjust door closure tension<br>— provide personal assistance in entering and leaving building |
| 5. Accessing elevator to reach work area | — elevator call and floor buttons are too high for easy access from a wheelchair | — lower or modify elevator call and floor buttons<br>— provide personal assistance<br>— provide "reacher" or "stick" |

The selecting official is satisfied that all the identified problems have a number of potential solutions. The selecting official will work closely with the supervisor, coordinator and selected person's to determine which of the alternative accommodations will be of greatest benefit for the disabled employee and in the best interests of the agency. Having gone through this process, the selecting official realizes the importance of considering the unique functioning of each individual with respect to the job requirements and the work environment.

# Appendix A

## Glossary of Functional Limitations Categories

The source of functional limitations categories and statistical data described below is: Muelier, James. *Designing For Functional Limitations*, Job Development Laboratory, The George Washington University: Washington, D.C., August 1980).

- **Difficulty in Interpreting Information**
  Persons with this limitation have limited ability to interpret or understand the meaning of spoken or written information. Approximately seven percent of the U.S. population is affected to some degree. Persons with such disabilities as cerebral palsy, stroke, learning disability and mental retardation *may* experience this limitation;

- **Limitation of Sight**
  Persons with this limitation include those who cannot read newspaper-size print, are legally blind (20/200), have a vision field defect of 10 percent or less, or have hemianopsia (one-sided vision). Less than one percent of the U.S. population is affected to some degree. Persons with such disabilities as cancer, cataracts, congenital or traumatic blindness, diabetes, glaucoma, tunnel vision and retina degeneration *may* experience this limitation;

- **Limitation of Hearing**
  Persons with this limitation cannot understand usable speech with or without amplification. Approximately three percent of the U.S. population is affected to some degree. Persons with such disabilities as brain damage, cancer, complications from other diseases, such as congenital or traumatic loss and otosclerosis *may* experience this limitation;

- **Limitation of Speech**
  Persons with this limitation have slow and/or indistinct speech, or use nonverbal communication. Approximately four percent of the U.S. population is affected to some degree. Persons with such disabilities as brain damage, cancer, cerebral palsy, stroke, and hearing disorders *may* experience this limitation;

- **Susceptibility to Fainting, Dizziness, Seizures**
  Persons with this limitation experience inducible or spontaneous fainting, dizziness, and/or seizures. Approximately two percent of the U.S. population is affected to some degree. Persons with such disabilities as cardiac conditions, cerebral palsy, and epilepsy *may* experience this limitation;

- **Incoordination**
  Persons with this limitation experience lack of control in placing or directing extremities (spasticity). Approximately one percent of the U.S. population is affected to some degree. Persons with

such disabilities as ataxia, cerebral palsy, stroke, hemiplegia, multiple sclerosis, and Parkinson's Disease *may* experience this limitation;

- **Limitation of Stamina**
  Persons with this limitation experience shortness of breath and/or abnormal elevation of blood pressure due to mild physical exertion. Approximately three percent of the U.S. population is affected to some degree. Persons with such disabilities as asthma, arthritis, cardiac conditions, cerebral palsy, stroke, emphysema, hypertension, multiple sclerosis, muscular dystrophy, renal disease, spinal cord injury, and tuberculosis *may* experience this limitation;

- **Difficulty in Moving Head**
  Persons with this limitation cannot easily look up, down, and/or to the side. Approximately one percent of the U.S. population is affected to some degree. Persons with such disabilities as arthritis, cerebral palsy, muscular dystrophy, and Parkinson's Disease *may* experience this limitation;

- **Limitation of Sensation**
  Persons with this limitation have impaired nerve reception (heat, touch, pain, pressure) in various parts of the body. Approximately one percent of the U.S. population is affected to some degree. Persons with such disabilities as stroke, polio, spinal cord injury, and trauma *may* experience this limitation;

- **Difficulty in Lifting and Reaching with Arms**
  Persons with this limitation experience decreased mobility, range of motion, and/or strength in their upper extremities. Approximatley six percent of the U.S. population is affected to some degree. Persons with such disabilities as cardiac conditions, cerebral palsy, congenital deformities, multiple sclerosis, muscular dystrophy, and spinal cord injury *may* experience this limitation;

- **Difficulty in Handling and Fingering**
  Persons with this limitation experience decreased mobility range of motion, and/or strength in their hands. Approximately one percent of the U.S. population is affected to some degree. Persons with such disabilities as amputations, arthritis, cardiac disorders, cerebral palsy, stroke, congenital deformities, polio, multiple sclerosis, muscular dystrophy, and spinal cord injury *may* experience this limitation;

- **Inability to use Upper Extremities**
  Persons with this limitation experience complete paralysis, severe incoordination or amputation of upper extremities. Approximately two percent of the U.S. population is affected to some degree. Persons with such disabilities as amputations, arthritis,

cerebral palsy, congenital deformities, polio, and spinal cord injury *may* experience this limitation;

- **Difficulty in Sitting**
  Persons with this limitation experience lack of strength, restriction of motion, and/or lack of trunk control in bending, turning, or balancing. Approximately five percent of the U.S. population is affected to some degree. Persons with such disabilities as arthritis, congenital deformities, scoliosis (lateral curvature of the spine) and spinal cord injury *may* experience this limitation;

- **Difficulty in Using Lower Extremities**
  Persons with this limitation experience slowness of gate, impairment of kneeling, rising, walking, standing, and/or stair-climbing. Approximately four percent of the U.S. population is affected to some degree. Persons with such disabilities as arthritis, cancer, cardiac disorders, cerebral palsy, stroke, multiple sclerosis, muscular dystrophy, congenital deformities, and spinal cord injury *may* experience this limitation; and

- **Poor Balance**
  Persons with this limitation find it difficult or impossible to maintain balance when moving or when stationary (standing, walking, rising, stair climbing). Approximately two percent of the U.S. population is affected to some degree. Persons with such disabilities as amputations, ataxia, cerebral palsy, stroke, deafness, multiple sclerosis, muscular dystrophy, Parkinson's Disease, and spinal cord injury *may* experience this limitation.

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